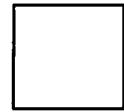


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Unit 10: Circles

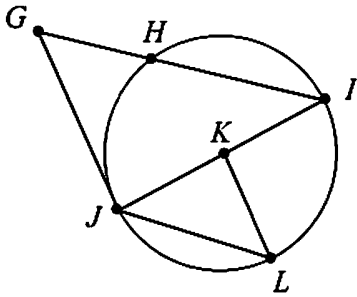


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Homework 1: Parts of a Circle,
Area & Circumference

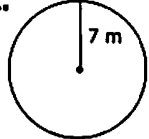
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1. Give an example of each circle part using the diagram below.

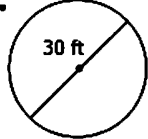


- a) Center: \underline{K}
 - * b) Radius: \underline{KL}
 - * c) Chord: \underline{JL}
 - d) Diameter: \underline{JI}
 - e) Secant: \underline{GI}
 - f) Tangent: \underline{EU}
 - g) Point of Tangency: \underline{U}
 - * h) Minor Arc: $\underline{\widehat{HI}}$
 - * i) Major Arc: $\underline{\widehat{HLJ}}$
 - * j) Semicircle: $\underline{\widehat{JHI}}$
 - * k) Central Angle: $\underline{\angle JKL}$
 - * l) Inscribed Angle: $\underline{\angle IJL}$
- * Several Answers possible

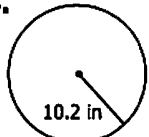
Directions: Find the area and circumference of each circle below.

2.  $A = \pi(7)^2$
 $A = 49\pi \approx \boxed{153.94 \text{ m}^2}$

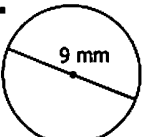
$C = 2\pi(7)$
 $C = 14\pi \approx \boxed{43.98 \text{ m}}$

3.  $A = \pi(15)^2$
 $A = 225\pi \approx \boxed{706.86 \text{ ft}^2}$

$C = 2\pi(15)$
 $C = 30\pi \approx \boxed{94.25 \text{ ft}}$

4.  $A = \pi(10.2)^2$
 $A = 104.04\pi \approx \boxed{326.85 \text{ in}^2}$

$C = 2\pi(10.2)$
 $C = 20.4\pi \approx \boxed{64.09 \text{ in}}$

5.  $A = \pi(4.5)^2$
 $A = 20.25\pi \approx \boxed{63.62 \text{ mm}^2}$

$C = 2\pi(4.5)$
 $C = 9\pi \approx \boxed{28.27 \text{ mm}}$

Directions: Use the area and circumference formulas to find the radius or diameter.

6. Find the radius of a circle with an area of 615.75 square kilometers. $A = \pi r^2$

$$\frac{615.75}{\pi} = \frac{\pi r^2}{\pi}$$

$$196 = r^2 \quad \boxed{r = 14 \text{ km}}$$

7. Find the diameter of a circle with a circumference of 15.71 yards. $C = 2\pi r$

$$\frac{15.71}{2\pi} = \frac{2\pi r}{2\pi}$$

$$2.5 = r \quad \boxed{d = 5 \text{ yd}}$$

8. Find the diameter of a circle with an area of 415.48 square inches.

$$\frac{415.48}{\pi} = \frac{\pi r^2}{\pi}$$

$$132.25 = r^2$$

$$11.5 = r$$

$$d = 23 \text{ in}$$

9. Find the radius of a circle with a circumference of 125.66 feet.

$$\frac{125.66}{2\pi} = \frac{2\pi r}{2\pi}$$

$$20\pi = r$$

10. Find the diameter of a circle with an area of 240.25π square millimeters.

$$\frac{240.25\pi}{\pi} = \frac{\pi r^2}{\pi}$$

$$240.25 = r^2$$

$$15.5 = r$$

$$d = 31 \text{ mm}$$

11. Find the radius of a circle with a circumference of 45π centimeters.

$$\frac{45\pi}{2\pi} = \frac{2\pi r}{2\pi}$$

$$22.5 \text{ cm} = r$$

Directions: Use the information given to find the area or circumference.

12. Find the area of a circle with a circumference of 11π feet.

$$\frac{11\pi}{2\pi} = \frac{2\pi r}{2\pi}$$

$$5.5 = r$$

$$A = \pi(5.5)^2$$

$$= 30.25\pi$$

$$\approx 95.03 \text{ ft}^2$$

13. Find the circumference of a circle with an area of 676π square millimeters.

$$\frac{676\pi}{\pi} = \frac{\pi r^2}{\pi}$$

$$676 = r^2$$

$$26 = r$$

$$C = 2\pi(26)$$

$$= 52\pi$$

$$\approx 163.36 \text{ mm}$$

14. Find the circumference of a circle with an area of 1,134.11 square meters.

$$\frac{1134.11}{\pi} = \frac{\pi r^2}{\pi}$$

$$361 = r^2$$

$$19 = r$$

$$C = 2\pi(19)$$

$$= 38\pi$$

$$\approx 119.38 \text{ m}$$

15. Find the area of a circle with a circumference of 53.41 inches.

$$\frac{53.41}{2\pi} = \frac{2\pi r}{2\pi}$$

$$8.5 = r$$

$$A = \pi(8.5)^2$$

$$= 72.25\pi$$

$$\approx 226.98 \text{ in}^2$$

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Homework 2: Central Angles, Arc Measures, & Arc Lengths

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Directions: Find the following arc measures.

1.
$$\begin{aligned} m\widehat{DE} &= 104^\circ \\ m\widehat{FE} &= 76^\circ \\ m\widehat{DEF} &= 180^\circ \\ m\widehat{CFD} &= 284^\circ \\ m\widehat{DFE} &= 256^\circ \end{aligned}$$

2.
$$\begin{aligned} m\widehat{TQ} &= 69^\circ \\ m\widehat{QR} &= 155^\circ \\ m\widehat{TS} &= 111^\circ \\ m\widehat{SOR} &= 335^\circ \\ m\widehat{ROT} &= 224^\circ \end{aligned}$$

3.
$$\begin{aligned} m\widehat{KL} &= 23^\circ \\ m\widehat{LON} &= 203^\circ \\ m\widehat{OM} &= 113^\circ \\ m\widehat{KNL} &= 337^\circ \\ m\widehat{NL} &= 157^\circ \end{aligned}$$

4.
$$\begin{aligned} m\widehat{YU} &= 17^\circ \\ m\widehat{XW} &= 125^\circ \\ m\widehat{XVW} &= 235^\circ \\ m\widehat{VW} &= 55^\circ \\ m\widehat{YWU} &= 343^\circ \end{aligned}$$

Directions: Find the value of x.

5.
$$\begin{aligned} 9x + 54 &= 180 \\ 9x &= 126 \\ x &= 14 \end{aligned}$$

$x = \underline{14}$

6.
$$\begin{aligned} 21x - 9 &= 117 \\ 21x &= 126 \\ x &= 6 \end{aligned}$$

$x = \underline{6}$

Directions: Find the value of x and each arc measure.

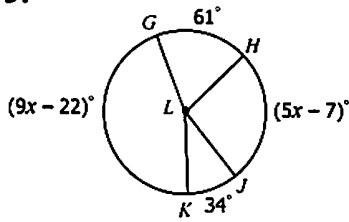
7.
$$\begin{aligned} 13x - 28 &= 180 \\ 13x &= 208 \\ x &= 16 \end{aligned}$$

$$\begin{aligned} x &= 16 \\ m\widehat{DE} &= 167^\circ \\ m\widehat{EF} &= 13^\circ \\ m\widehat{DFG} &= 347^\circ \end{aligned}$$

8.
$$\begin{aligned} 10x - 45 &= 6x - 1 \\ 4x - 45 &= -1 \\ 4x &= 44 \\ x &= 11 \end{aligned}$$

$$\begin{aligned} x &= 11 \\ m\widehat{MN} &= 65^\circ \\ m\widehat{NP} &= 115^\circ \\ m\widehat{NOP} &= 245^\circ \end{aligned}$$

9.



$$14x - 29 = 265$$

$$14x = 294$$

$$x = 21$$

$$x = \frac{21}{1}$$

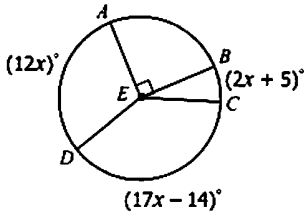
$$m\widehat{GK} = \frac{167^\circ}{1}$$

$$m\widehat{HJ} = \frac{98^\circ}{1}$$

$$m\widehat{HGJ} = \frac{262^\circ}{1}$$

$$m\widehat{GKJ} = \frac{201^\circ}{1}$$

10.



$$31x - 9 = 270$$

$$31x = 279$$

$$x = 9$$

$$x = \frac{9}{1}$$

$$m\widehat{AD} = \frac{108^\circ}{1}$$

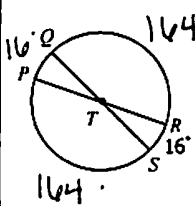
$$m\widehat{BC} = \frac{23^\circ}{1}$$

$$m\widehat{DC} = \frac{139^\circ}{1}$$

$$m\widehat{DBC} = \frac{221^\circ}{1}$$

Directions: Find each arc length. Round to the nearest hundredth.

11. If $TR = 11$ ft, find the length of \widehat{PS} .



$$l = \frac{164 \cdot 22\pi}{360}$$

$$= \frac{3608\pi}{360}$$

$$\approx \boxed{31.49 \text{ ft}}$$

12. If $MK = 10$ m, find the length of \widehat{MKL} .

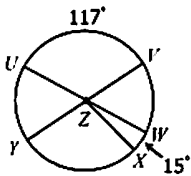


$$l = \frac{218 \cdot 10\pi}{360}$$

$$= \frac{2180\pi}{360}$$

$$\approx \boxed{19.02 \text{ m}}$$

13. If $YV = 28$ in, find the length of \widehat{VYX} .

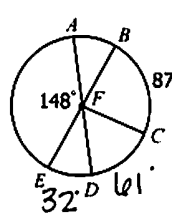


$$l = \frac{282 \cdot 28\pi}{360}$$

$$= \frac{7896\pi}{360}$$

$$\approx \boxed{68.91 \text{ in}}$$

14. If $AF = 23$ cm, find the length of \widehat{EC} .



$$l = \frac{93.46\pi}{360}$$

$$= \frac{4278\pi}{360}$$

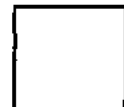
$$\approx \boxed{37.33 \text{ cm}}$$

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Homework 3: Chords & Arcs



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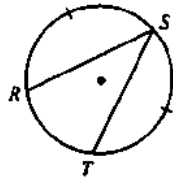
Directions: Find each value or measure.

1. If $RS = 59$ and $ST = 10x - 31$, find x .

$$10x - 31 = 59$$

$$10x = 90$$

$$x = 9$$

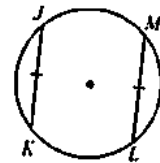


2. If $m\widehat{JK} = (7x - 39)^\circ$ and $m\widehat{ML} = 87^\circ$, find x .

$$7x - 39 = 87$$

$$7x = 126$$

$$x = 18$$



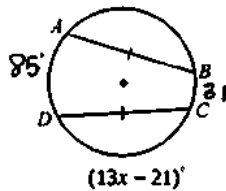
3. If $m\widehat{AD} = 85^\circ$ and $m\widehat{BC} = 31^\circ$, find the value of x .

$$2(13x - 21) = 244$$

$$26x - 42 = 244$$

$$26x = 286$$

$$x = 11$$



4. If $LM = 41 - 2x$ and $NP = 7x + 5$, find LM .

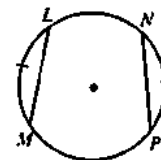
$$41 - 2x = 7x + 5$$

$$36 - 2x = 7x$$

$$36 = 9x$$

$$4 = x$$

$$LM = 41 - 2(4) = 33$$



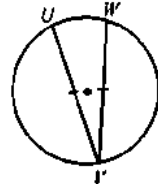
5. If $m\widehat{UV} = (8x - 17)^\circ$ and $m\widehat{WV} = (5x + 52)^\circ$, find $m\widehat{WV}$.

$$8x - 17 = 5x + 52$$

$$3x - 17 = 52$$

$$3x = 69$$

$$x = 23$$



$$m\widehat{WV} = 5(23) + 52 = 167^\circ$$

6. If $DE = GF$, $HJ = 3x + 20$ and $JI = 15x - 64$, find JI .

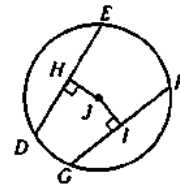
$$3x + 20 = 15x - 64$$

$$20 = 12x - 64$$

$$84 = 12x$$

$$7 = x$$

$$JI = 15(7) - 64 = 41$$



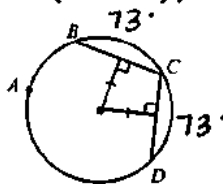
7. If $m\widehat{BC} = (9x - 53)^\circ$ and $m\widehat{CD} = (2x + 45)^\circ$, find $m\widehat{BAD}$.

$$9x - 53 = 2x + 45$$

$$7x - 53 = 45$$

$$7x = 98$$

$$x = 14$$



$$m\widehat{BC} = 9(14) - 53 = 73^\circ$$

$$m\widehat{BAD} = 214^\circ$$

8. If $m\widehat{LM} = (8x - 56)^\circ$ and $m\widehat{NP} = (5x + 22)^\circ$, find $m\widehat{LP}$.

$$8x - 56 = 5x + 22$$

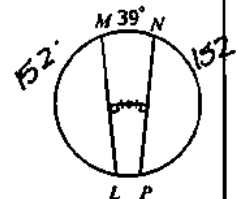
$$3x - 56 = 22$$

$$3x = 78$$

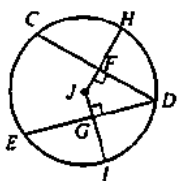
$$x = 26$$

$$m\widehat{LM} = 8(26) - 56 = 152$$

$$m\widehat{LP} = 17^\circ$$



9. If $JG = JF$, $GD = 13$, and $m\widehat{CD} = 136^\circ$, find each measure.



$$ED = \underline{26}$$

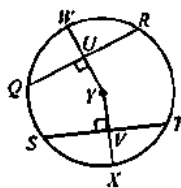
$$CF = \underline{13}$$

$$m\widehat{ED} = \underline{136^\circ}$$

$$m\widehat{HD} = \underline{68^\circ}$$

$$m\widehat{CE} = \underline{88^\circ}$$

10. If $YU = YV$, $ST = 16$, $m\widehat{QS} = 34^\circ$, and $m\widehat{RT} = 98^\circ$, find each measure.



$$QU = \underline{8}$$

$$QR = \underline{16}$$

$$m\widehat{ST} = \underline{114^\circ}$$

$$m\widehat{QR} = \underline{114^\circ}$$

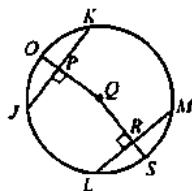
$$m\widehat{XT} = \underline{57^\circ}$$

11. If $PQ = QR$, $JK = 3x + 23$ and $LM = 9x - 19$, find PK .

$$9x - 19 = 3x + 23$$

$$6x = 42$$

$$x = 7$$



$$JK = 3(7) + 23 = 44$$

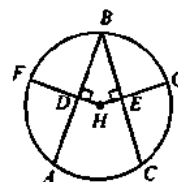
$$\boxed{PK = 22}$$

12. If $DH = HE$, $m\widehat{BG} = (9x - 20)^\circ$ and $m\widehat{GC} = (5x + 28)^\circ$, find $m\widehat{AB}$.

$$9x - 20 = 5x + 28$$

$$4x = 48$$

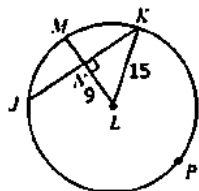
$$x = 12$$



$$m\widehat{BG} = 9(12) - 20 = 88^\circ$$

$$\boxed{m\widehat{AB} = 176^\circ}$$

Use the circle below for questions 13 - 16.



13. Find NK .

$$9^2 + x^2 = 15^2$$

$$81 + x^2 = 225$$

$$x^2 = 144$$

$$x = 12$$

$$\boxed{NK = 12}$$

14. Find $m\widehat{MK}$.

$$\cos y = 9/15$$

$$y = \cos^{-1}(9/15)$$

$$y = 53.1^\circ$$

$$\boxed{m\widehat{MK} = 53.1^\circ}$$

15. Find JK .

$$2(12) = 24$$

$$\boxed{JK = 24}$$

16. Find $m\widehat{JPK}$.

$$2(53.1) = 106.2$$

$$\boxed{m\widehat{JPK} = 253.8^\circ}$$

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Homework 4: Inscribed Angles

**** This is a 2-page document! ****

Directions: Find each angle or arc measure.

1. $m\widehat{JML} = 176^\circ$

2. $m\angle ABC = 17^\circ$

3. $m\angle WXY = 59^\circ$

4. $m\widehat{RS} = 105^\circ$

5. $m\widehat{FE} = 54^\circ$

6. $m\angle GHJ = 73^\circ$
 $m\angle GIJ = 73^\circ$

7. $m\angle A = 79^\circ$
 $m\angle B = 112^\circ$

8. $m\angle Q = 89^\circ$
 $m\angle R = 123^\circ$
 $m\angle S = 91^\circ$

Directions: Find the value of x.

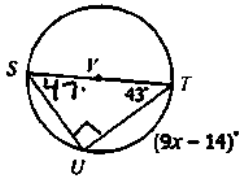
9. $67 = \frac{1}{2}(16x - 10)$
 $67 = 8x - 5$
 $72 = 8x$
 $9 = x$

10. $7x + 9 = \frac{1}{2}(46)$
 $7x + 9 = 23$
 $7x = 14$
 $x = 2$

11. $5x + 2 = \frac{1}{2}(234)$
 $5x + 2 = 117$
 $5x = 115$
 $x = 23$

12. $17x - 20 = 167$
 $17x = 187$
 $x = 11$

13.



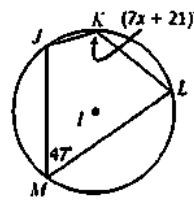
$$2(47) = 9x - 14$$

$$94 = 9x - 14$$

$$108 = 9x$$

$$\boxed{12 = x}$$

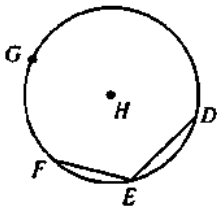
14.



$$7x + 21 = 133$$

$$7x = 112$$

$$\boxed{x = 16}$$

15. If $m\angle DEF = (6x + 37)^\circ$ and $m\widehat{FGD} = (19x - 31)^\circ$, find $m\angle DEF$.

$$2(6x + 37) = 19x - 31$$

$$12x + 74 = 19x - 31$$

$$74 = 7x - 31$$

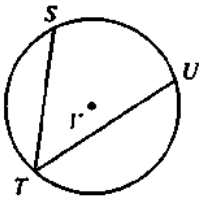
$$105 = 7x$$

$$15 = x$$

$$m\angle DEF =$$

$$6(15) + 37$$

$$\boxed{= 127^\circ}$$

16. If $m\angle STU = (13x - 6)^\circ$, $m\widehat{SU} = (21x + 8)^\circ$, and $m\widehat{UT} = 143^\circ$, find $m\widehat{ST}$.

$$2(13x - 6) = 21x + 8$$

$$26x - 12 = 21x + 8$$

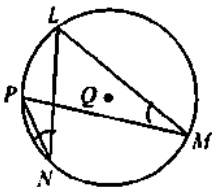
$$5x - 12 = 8$$

$$5x = 20$$

$$x = 4$$

$$m\widehat{SU} = 21(4) + 8 = 92^\circ$$

$$\boxed{m\widehat{ST} = 125^\circ}$$

17. If $m\angle LMP = (5x - 19)^\circ$ and $m\angle LNP = (2x + 11)^\circ$, find $m\widehat{PL}$.

$$5x - 19 = 2x + 11$$

$$3x - 19 = 11$$

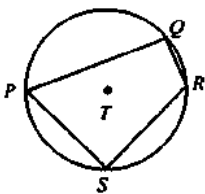
$$3x = 30$$

$$x = 10$$

$$m\angle LMP = 5(10) - 19$$

$$= 31^\circ$$

$$\boxed{m\widehat{PL} = 2(31) = 62^\circ}$$

18. If $m\angle P = (4x - 1)^\circ$ and $m\angle R = (12x - 27)^\circ$, find $m\widehat{QS}$.

$$16x - 28 = 180$$

$$16x = 208$$

$$x = 13$$

$$m\angle R = 12(13) - 27$$

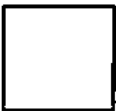
$$= 129^\circ$$

$$m\widehat{QS} = 2(129)$$

$$\boxed{= 258^\circ}$$

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Homework 5: Tangent Lines

**** This is a 2-page document! ****

Directions: Determine if \overline{XY} is tangent to circle Z.

1. $9.6^2 + 12.8^2 = 16^2$
 $256 = 256 \checkmark$
 yes!

2. $8^2 + 10^2 = 132$
 $164 \neq 169$
 no!

3. $5^2 + 17^2 = 20^2$
 $314 \neq 14$
 no!

4. $2.7^2 + 3.6^2 = 4.5^2$
 $20.25 = 20.25$
 yes!

Directions: Find the value of x . Assume that segments that appear to be tangent are tangent.

5. $9^2 + 14^2 = x^2$
 $277 = x^2$
 $x = 16.6$

6. $x^2 + 14 \cdot 2^2 = 18^2$
 $x^2 + 201.64 = 324$
 $x^2 = 122.36$
 $x = 11.1$

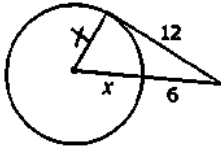
7. $24^2 + 32^2 = y^2$
 $1600 = y^2$
 $40 = y$
 $40 = x + 24$
 $x = 16$

8. $x^2 + 15^2 = 32^2$
 $x^2 + 225 = 1024$
 $x^2 = 799$
 $x = 28.3$

9. $y^2 + 12.6^2 = 21^2$
 $y^2 + 158.76 = 441$
 $y^2 = 282.24$
 $y = 16.8$
 $2x = 16.8$
 $x = 8.4$

10. $9^2 + 26^2 = x^2$
 $757 = x^2$
 $x = 27.5$

11.



$$x^2 + 12^2 = (x+6)^2$$

$$x^2 + 144 = x^2 + 12x + 36$$

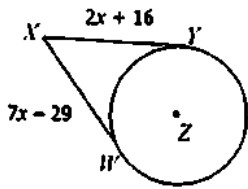
$$144 = 12x + 36$$

$$108 = 12x$$

$$9 = x$$

Directions: Find each value or measure. Assume that segments that appear to be tangent are tangent.

12. Find WX .



$$2x + 16 = 7x - 29$$

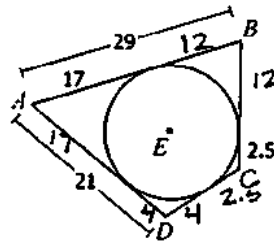
$$16 = 5x - 29$$

$$45 = 5x$$

$$9 = x$$

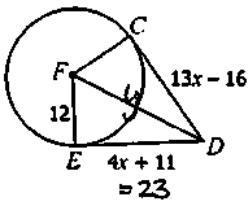
$$WX = 7(9) - 29 = 34$$

13. Find the perimeter of $ABCD$.



$$71$$

14. Find FD .



$$4x + 11 = 13x - 16$$

$$27 = 9x$$

$$3 = x$$

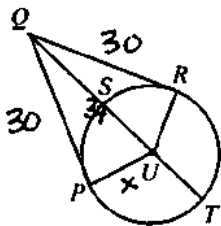
$$ED = 4(3) + 11 = 23$$

$$12^2 + 23^2 = y^2$$

$$673 = y^2$$

$$25.9 = y$$

15. If $PQ = 4x + 2$, $QR = 7x - 19$, and $QU = 34$, find ST .



$$4x + 2 = 7x - 19$$

$$21 = 3x$$

$$7 = x$$

$$PQ = 4(7) + 2 = 30$$

$$30^2 + x^2 = 34^2$$

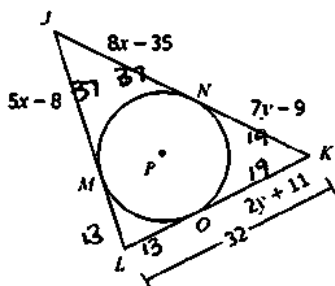
$$900 + x^2 = 1156$$

$$x^2 = 256$$

$$x = 16$$

$$ST = 32$$

16. Find the perimeter of $\triangle JKL$.



$$7y - 9 = 2y + 11$$

$$5y = 20$$

$$y = 4$$

$$OK = 2(4) + 11 = 19$$

$$5x - 8 = 8x - 35$$

$$27 = 3x$$

$$9 = x$$

$$JM = 5(9) - 8 = 37$$

$$138$$

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Homework 6: Arc & Angle Measures

**** This is a 2-page document! ****

Directions: Find each value or measure. Assume that segments that appear to be tangent are tangent.

1. $m\angle YZV$

$$\frac{1}{2}(144 + 114)$$

$$\frac{1}{2}(258)$$

$$= 129^\circ$$

2. $m\widehat{AD}$

$$93 = \frac{1}{2}(161 + x)$$

$$186 = 161 + x$$

$$25 = x$$

3. $m\widehat{QS}$

$$m\widehat{QTS} = 2(128)$$

$$= 256$$

$$m\widehat{QS} = 104^\circ$$

4. $m\angle JLK$

$$m\widehat{JL} = 62^\circ$$

$$m\angle JLK = \frac{1}{2}(62)$$

$$= 31^\circ$$

5. $m\angle EFG$

$$\frac{1}{2}(121 - 39)$$

$$\frac{1}{2}(82)$$

$$= 41^\circ$$

6. $m\angle TUV$

$$\frac{1}{2}(252 - 108)$$

$$\frac{1}{2}(144)$$

$$= 72^\circ$$

7. $m\widehat{CF}$

$$53 = \frac{1}{2}(x - 41)$$

$$106 = x - 41$$

$$147 = x$$

8. $m\widehat{HJ}$

$$29 = \frac{1}{2}(96 - x)$$

$$58 = 96 - x$$

$$-38 = -x$$

$$x = 38^\circ$$

9. Solve for x.

$$5x - 7 = \frac{1}{2}(119 + 27)$$

$$5x - 7 = \frac{1}{2}(146)$$

$$5x - 7 = 73$$

$$5x = 80$$

$$x = 16$$

10. Solve for x.

$$23x - 3 = 204$$

$$23x = 207$$

$$x = 9$$

11. Solve for x.

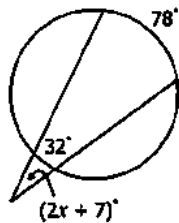
$$2x + 7 = \frac{1}{2}(78 - 32)$$

$$2x + 7 = \frac{1}{2}(46)$$

$$2x + 7 = 23$$

$$2x = 16$$

$$\boxed{x=8}$$



12. Solve for x.

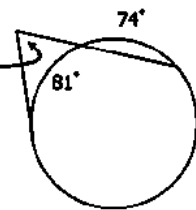
$$17x - 23 = \frac{1}{2}(205 - 81)$$

$$17x - 23 = \frac{1}{2}(124)$$

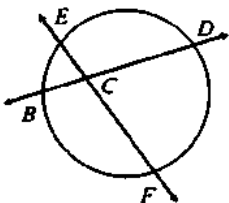
$$17x - 23 = 62$$

$$17x = 85$$

$$\boxed{x=5}$$



13. If $m\widehat{ED} = (9x - 3)^\circ$, $m\widehat{BF} = (15x - 39)^\circ$, and $m\angle BCF = (11x - 9)^\circ$, find $m\widehat{ED}$.



$$11x - 9 = \frac{1}{2}(9x - 3 + 15x - 39)$$

$$22x - 18 = 24x - 42$$

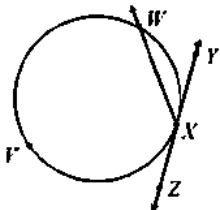
$$24 = 2x$$

$$12 = x$$

$$m\widehat{ED} = 9(12) - 3$$

$$= 105^\circ$$

14. If $m\widehat{WX} = (13x + 9)^\circ$ and $m\angle WXZ = (5x + 36)^\circ$, find $m\angle WXY$.



$$2(5x + 36) = 13x + 9$$

$$10x + 72 = 13x + 9$$

$$63 = 3x$$

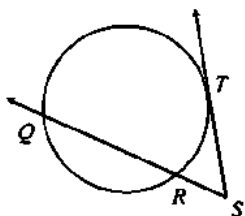
$$21 = x$$

$$m\angle WXZ = 5(21) + 36$$

$$= 141$$

$$\boxed{m\angle WXY = 39^\circ}$$

15. If $m\widehat{QT} = (27x + 3)^\circ$, $m\widehat{RT} = (9x - 5)^\circ$ and $m\angle RST = (10x - 2)^\circ$, find $m\widehat{RT}$.



$$10x - 2 = \frac{1}{2}(27x + 3 - (9x - 5))$$

$$20x - 4 = 18x + 8$$

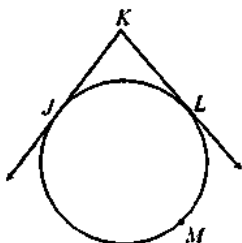
$$2x = 12$$

$$x = 6$$

$$m\widehat{RT} = 9(6) - 5$$

$$= 49^\circ$$

16. If $m\angle JKL = (8x - 9)^\circ$, $m\widehat{JL} = (12x - 28)^\circ$, and $m\widehat{JML} = (25x - 13)^\circ$, find $m\widehat{JML}$.



$$8x - 9 = \frac{1}{2}(25x - 13 - (12x - 28))$$

$$16x - 18 = 13x + 15$$

$$3x = 33$$

$$x = 11$$

$$m\widehat{JML} = 25(11) - 13$$

$$= 262^\circ$$

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Homework 7: Segments Lengths

**** This is a 2-page document! ****

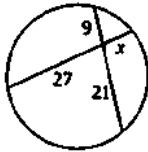
Directions: Find each value or measure. Assume that segments that appear to be tangent are tangent.

1. Solve for x .

$$27 \cdot x = 9 \cdot 21$$

$$27x = 189$$

$$x = 7$$



2. Find FD .

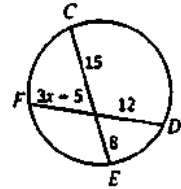
$$12(3x-5) = 15 \cdot 8$$

$$36x - 60 = 120$$

$$36x = 180$$

$$x = 5$$

$$FD = 22$$



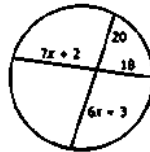
3. Solve for x .

$$18(7x+2) = 20(6x+3)$$

$$126x + 36 = 120x + 60$$

$$6x = 24$$

$$x = 4$$



4. Find US .

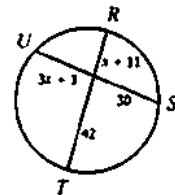
$$42(x+11) = 30(3x+1)$$

$$42x + 462 = 90x + 30$$

$$432 = 48x$$

$$x = 9$$

$$US = 58$$



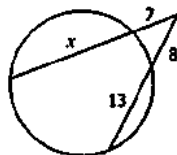
5. Solve for x .

$$7(x+7) = 8 \cdot 21$$

$$7x + 49 = 168$$

$$7x = 119$$

$$x = 17$$



6. Find MN .

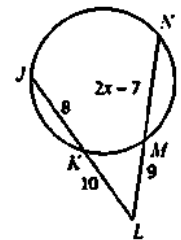
$$10 \cdot 18 = 9(2x+2)$$

$$180 = 18x + 18$$

$$162 = 18x$$

$$x = 9$$

$$MN = 11$$



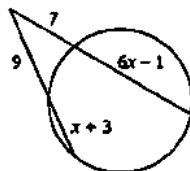
7. Solve for x .

$$9(x+12) = 7(6x+6)$$

$$9x + 108 = 42x + 42$$

$$66 = 33x$$

$$x = 2$$



8. Find YZ .

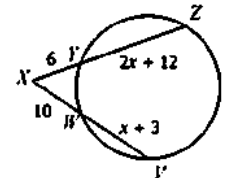
$$6(2x+18) = 10(x+13)$$

$$12x + 108 = 10x + 130$$

$$2x = 22$$

$$x = 11$$

$$YZ = 34$$



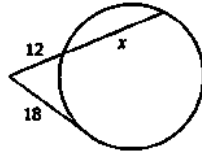
9. Solve for x.

$$18^2 = 12(x+12)$$

$$324 = 12x + 144$$

$$180 = 12x$$

$$x = 15$$



10. Find AC.

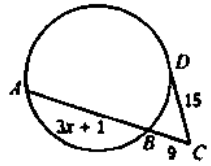
$$15^2 = 9(3x+10)$$

$$225 = 27x + 90$$

$$135 = 27x$$

$$x = 5$$

$$AC = 25$$

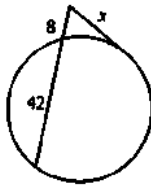


11. Solve for x.

$$x^2 = 8(50)$$

$$x^2 = 400$$

$$x = 20$$



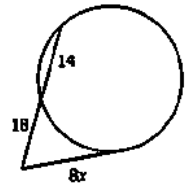
12. Solve for x.

$$(8x)^2 = 18(32)$$

$$64x^2 = 576$$

$$x^2 = 9$$

$$x = 3$$



13. Solve for x.

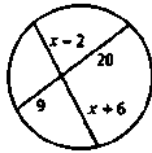
$$(x-2)(x+6) = 9 \cdot 20$$

$$x^2 + 4x - 12 = 180$$

$$x^2 + 4x - 192 = 0$$

$$(x+16)(x-12) = 0$$

$$x = -16 \quad x = 12$$



14. Solve for x.

$$8(27) = (x+4)(4x+4)$$

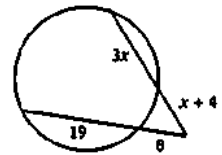
$$216 = 4x^2 + 20x + 16$$

$$0 = 4x^2 + 20x - 200$$

$$0 = 4(x^2 + 5x - 50)$$

$$0 = 4(x+10)(x-5)$$

$$x = -10 \quad x = 5$$



15. Solve for x.

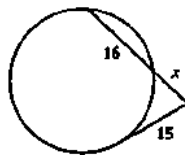
$$15^2 = x(x+16)$$

$$225 = x^2 + 16x$$

$$0 = x^2 + 16x - 225$$

$$0 = (x+25)(x-9)$$

$$x = -25 \quad x = 9$$



16. Solve for x.

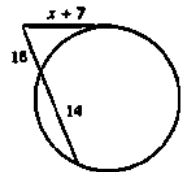
$$(x+7)^2 = 18(32)$$

$$x^2 + 14x + 49 = 576$$

$$x^2 + 14x - 527 = 0$$

$$(x+31)(x-17) = 0$$

$$x = -31 \quad x = 17$$



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Homework 8: Equations of Circles



**** This is a 2-page document! ****

Directions: Use the information given to write the equation of the circle.

- 1. Center: (2, 8), Radius: 3 $(x-2)^2 + (y-8)^2 = 9$
- 2. Center: (5, -13), Radius: 11 $(x-5)^2 + (y+13)^2 = 121$
- 3. Center: (-9, -7), Diameter: 34 $r=17$ $(x+9)^2 + (y+7)^2 = 289$
- 4. Center: (-8, 0), Diameter: 5 $r=2.5$ $(x+8)^2 + y^2 = 6.25$
- 5. Center: (0, -16), Radius: $\sqrt{15}$ $x^2 + (y+16)^2 = 15$
- 6. Center: (12, -1), Radius: $\sqrt{209}$ $(x-12)^2 + (y+1)^2 = 209$

7.

$(-3, 6)$
 $r=2$

$(x+3)^2 + (y-6)^2 = 4$

8.

$(0, -2)$
 $r=6$

$x^2 + (y+2)^2 = 36$

9. Center: (-10, -4), Point on Circle: (4, -2)

$rad = \sqrt{(-10-4)^2 + (-4+2)^2}$

$= \sqrt{196+4}$

$= \sqrt{200}$

$(x+10)^2 + (y+4)^2 = 200$

10. Center: (-9, -3), Point on Circle: (-11, 2)

$rad = \sqrt{(-9+11)^2 + (-3-2)^2}$

$= \sqrt{4+25}$

$= \sqrt{29}$

$(x+9)^2 + (y+3)^2 = 29$

11. Center: (5, -7), Point on Circle: (-3, -1)

$$\begin{aligned} \text{rad} &= \sqrt{(5+3)^2 + (-7+1)^2} \\ &= \sqrt{64 + 36} \\ &= \sqrt{100} \\ &= 10 \end{aligned}$$

$$(x-5)^2 + (y+7)^2 = 100$$

12. Center: (8, 2), Point on Circle: (14, -1)

$$\begin{aligned} \text{rad} &= \sqrt{(8-14)^2 + (2+1)^2} \\ &= \sqrt{36 + 9} \\ &= \sqrt{45} \end{aligned}$$

$$(x-8)^2 + (y-2)^2 = 45$$

13. Center: (10, 7), Circumference: 14π $r=7$

$$(x-10)^2 + (y-7)^2 = 49$$

14. Center: (0, -1), Circumference: 25π $r=12.5$

$$x^2 + (y+1)^2 = 156.25$$

15. Center: (-4, -5), Area: 400π $r^2=100$

$$(x+4)^2 + (y+5)^2 = 400$$

16. Center: (-6, 2), Area: π $r^2=1$

$$(x+6)^2 + (y-2)^2 = 1$$

Directions: Given the equation of the circle, identify the center and radius or diameter.

17. $(x-9)^2 + (y-4)^2 = 36$

Center: (9, 4); Radius: 6

18. $(x+1)^2 + (y-1)^2 = 196$

Center: (-1, 1); Diameter: 28 $r=14$

19. $(x+6)^2 + y^2 = 90.25$

Center: (-6, 0); Diameter: 19 $r=9.5$

20. $(x-2)^2 + (y+13)^2 = 150$

Center: (2, -13); Radius: $\sqrt{150}$

21. Write the equation of a circle with diameter endpoints of (13, -1) and (-15, 9).

Midpoint | Center:

$$\left(\frac{13-15}{2}, \frac{-1+9}{2} \right)$$

$$(-1, 4)$$

radius: $\sqrt{(13+1)^2 + (-1-4)^2}$

$$= \sqrt{196 + 25}$$

$$= \sqrt{221}$$

$$(x+1)^2 + (y-4)^2 = 221$$